Name_____

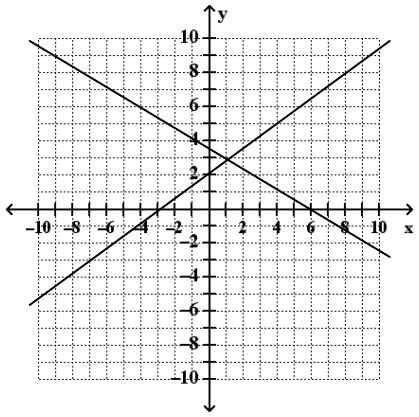
Algebra I Final Review Semester 2

*No graphing calculators. Simple or scientific calculators may be used on all problems.

State whether there is one, none, or infinitely many solutions to each system of equations. If there is one solution, state that specific solution.

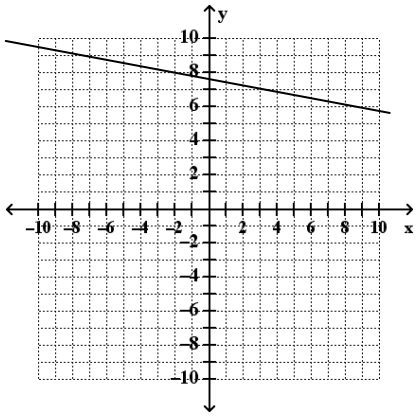
1. one none infinitely many
Number of solutions - Circle one

Specific Solution: (_____ , _____)



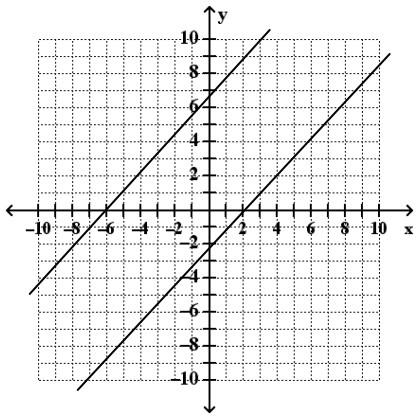
2. one none infinitely many
Number of solutions - Circle one

Specific Solution: (_____ , _____)



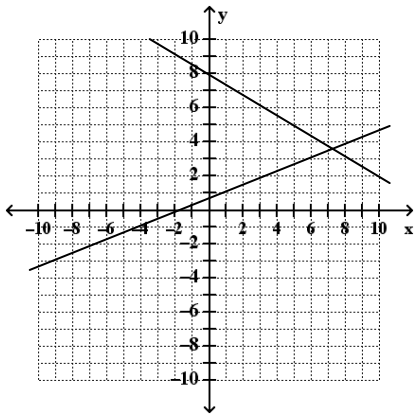
3. one none infinitely many
Number of solutions - Circle one

Specific Solution: (_____ , _____)



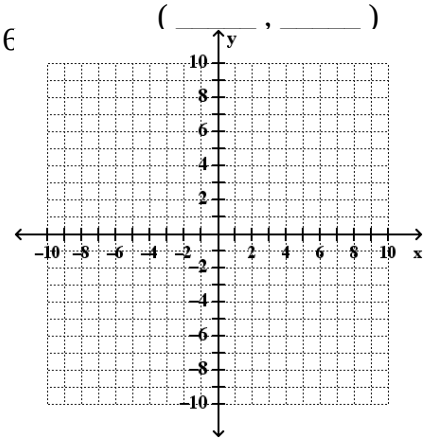
4. one none infinitely many
Number of solutions - Circle one

Specific Solution: (_____ , _____)

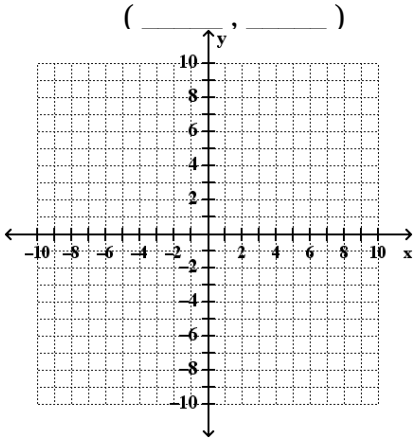


Solve each system of equations by **graphing**.

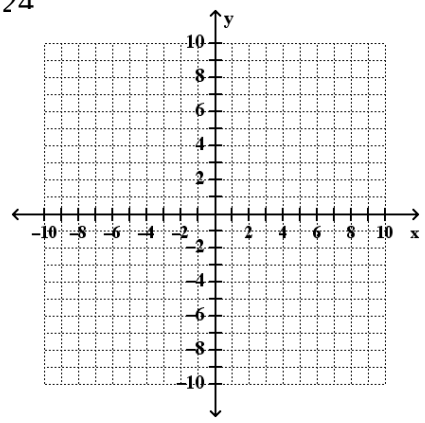
5. $x - y = 7$
$3x + 2y = 6$
(_____ , _____)



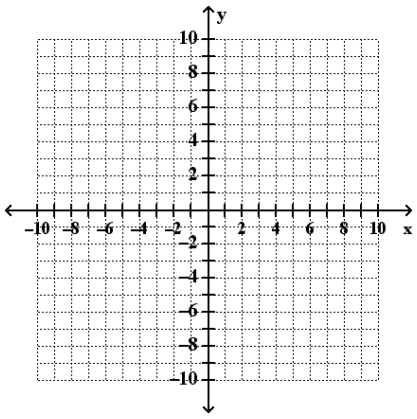
6. $y = 2x + 3$
$y = \frac{-3}{2}x - 4$
(_____ , _____)



7. $y = -2x + 6$
$3x + 4y = 24$
(_____ , _____)



8. $3x - 5y = 10$
$y = \frac{3}{5}x$
(_____ , _____)



Solve each system of equations. Show work for credit. No decimal answers.

9. $y = 7x + 4$
$x + y = 4$
(_____ , _____)

10. $3x - y = 4$
$x + 5y = -4$
(_____ , _____)

Solve each system of equations. Show work for credit. No decimal answers.

11. $\begin{aligned} -3x + 4y &= 29 \\ 3x + 2y &= -17 \end{aligned}$ (_____ , _____)

12. $\begin{aligned} 4x - 9y &= 61 \\ 10x + 3y &= 25 \end{aligned}$ (_____ , _____)

13. $\begin{aligned} 6x + y &= 13 \\ y - x &= -8 \end{aligned}$ (_____ , _____)

14. $\begin{aligned} 4x - y &= 105 \\ x + 7y &= -10 \end{aligned}$ (_____ , _____)

Solve each word problem. Show work for credit.

15. Claire bought 3 bars of soap and 5 sponges for $2.31. Steve bought 5 bars of soap and 3 sponges for $3.05. Find the cost of each item.

1 bar of Soap = $_____

1 Sponge = $_____

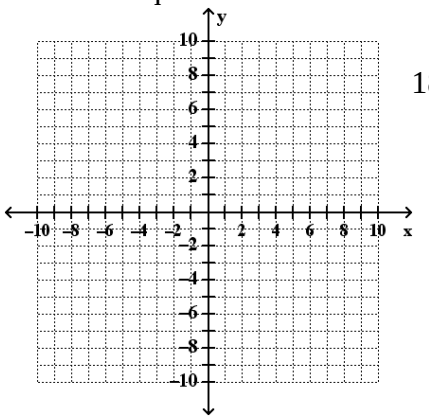
16. A local band sold 900 tickets to a concert for a total of $9774. Floor seats cost $19 each and balcony seats cost $10 each. How many of each type of ticket were sold?

floor tickets = _____

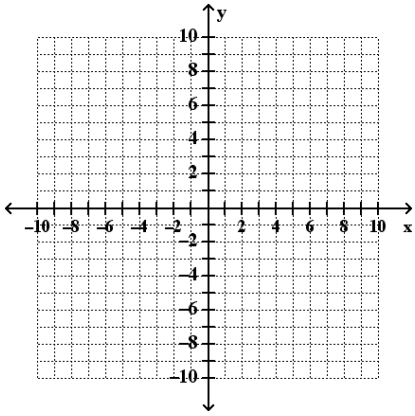
balcony tickets = _____

Graph each system of linear inequalities.

17. $y > -6x + 5$
$y \le x - 2$



18. $y \le \frac{1}{4}x - 3$
$y \le -5x + 1$



Simplify each expression. Rewrite any negative exponents for your final answer.

19. x^{-6}

20. $-5m^2m^{-8}$

21. $\left(m^7x^{-5}\right)^2$

22. $\left(x^2n^4\right)^3\left(n^{-8}\right)$

23. $\left(w^{-2}j^{-4}\right)^{-3}\left(j^0\right)$

24. $\left(-3n^4\right)^2$

25. $\frac{r^5}{r^5}$

26. $\frac{1}{a^{-4}}$

27. $\frac{w^7}{w^{-6}}$

28. $\dfrac{a^2b^{-7}c^4}{a^5b^3c^{-2}}$

29. $\dfrac{\left(2m^5\right)^3}{2m^4}$

30. $\dfrac{m^2n^6}{m^7n}$

31. $\dfrac{\left(2n^5a\right)^3m^6}{4am^7}$

32. $\dfrac{\left(2c^5x^4\right)^2c^{-3}}{24x^5c^4}$

33. $\dfrac{\left(aw^{-2}\right)^5w^4}{a^3}$

Write each number in scientific notation.

34. 34,000,000

35. 0.00063

36. 0.00002

37. 360,000

38. 6,200,000,000

39. 0.05

Write each number in standard notation.

40. 8.05×10^6

41. 3.2×10^{-7}

42. 9.0×10^8

43. 2.35×10^2

44. 2.001×10^{-5}

45. 5.2956×10^3

Simplify each polynomial completely. Write your answer in standard form.

46. $\left(x^2+3x-2\right)+\left(4x^3-5x^2+2x-9\right)$

47. $\left(4m^2+7m-4\right)$
$+\ \left(2m^2-6m+8\right)$

48. $\left(8n^2+n+10\right)$
$-\ \left(9n^2-9n-1\right)$

49. $\left(5x^3+3x^2-7x+10\right)-\left(3x^3-x^2+4x-1\right)$

50. $4b\left(b^2+3\right)$

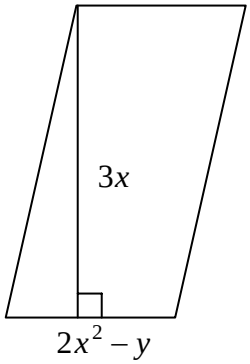
51. $9c\left(c^2-3c+5\right)$

52. $5k\left(k^2+8j\right)$

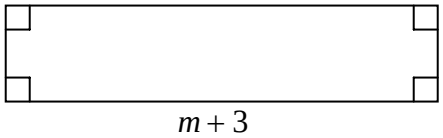
53. $-3x^2y\left(x^2+3xy-1\right)$

Find, and simplify completely, an expression for the area of each figure below using the formula $Area = base \cdot height$.

54.



55.



Simplify each polynomial completely. Write your answer in standard form.

56. $(5c+3)(c-2)$

57. $(3x+5)(x+1)$

58. $(2n^2-3)(2n^2+4)$

59. $(v+3)(v+7)$

60. $(3x+1)^2$

61. $(5y+4)^2$

62. $(w+2)(w^2+2w-1)$

63. $(2n^2+n+3)(n-1)$

Factor each expression completely.

64. x^2+6x+9

65. a^2+a-2

Factor each expression completely.

66. $m^2 - 4m + 3$

67. $x^2 + 9x - 22$

68. $x^2 - 7x - 18$

69. $2n^2 + n - 3$

70. $3x^2 + 10x - 8$

71. $9y^2 + 12y + 4$

72. $m^2 - 25$

73. $4x^2 - 81$

74. $9y^2 - 1$

Solve each equation using the Zero Product Property.

75. $(x + 2)(x - 19) = 0$

76. $(2m + 8)(m - 1) = 0$

77. $(3a - 2)(5a - 5) = 0$

Solve each equation. Round to the nearest hundredth. The Quadratic Formula is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

78. $2x^2 + 2x - 12 = 0$ Answer: _____

79. $x^2 - 5x - 7 = 0$ Answer: _____

80. $2x^2 + 5x - 40 = 0$ Answer: _____

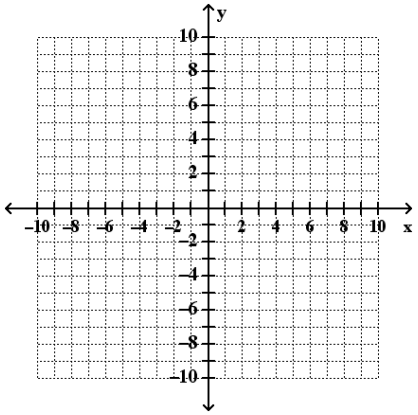
Find the roots, axis of symmetry and vertex (may use $x = \frac{-b}{2a}$) of the quadratic equation, then graph.

81. $y = x^2 + x - 6$

$x =$ _____ & $x =$ _____
Roots

$x =$ _____
Axis of Symmetry

(_____ , _____)
Vertex



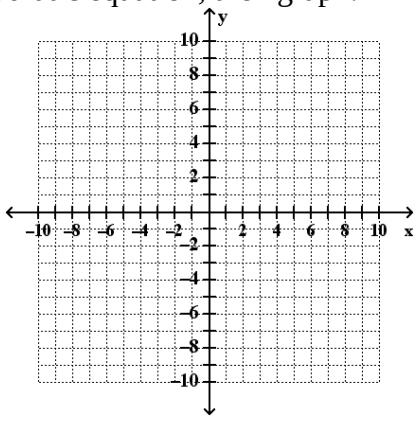
Find the roots, axis of symmetry and vertex (may use $x = \frac{-b}{2a}$) of the quadratic equation, then graph.

82. $y = x^2 - 2x - 8$

$x =$ _____ & $x =$ _____
Roots

$x =$ _____
Axis of Symmetry

(_____ , _____)
Vertex



83. A stick is thrown into the air so that its height *h* in feet after *t* seconds is given by the function

$h = -16t^2 + 160t$

(a) Fill in the table of values for the situation above.

(b) Use the table of values to graph the function.

- make sure to label your axes!

t	h
0	
2	
	384
5	
10	
13	

(c) What is the maximum height the stick reaches? _____

(d) How many seconds is the stick in the air? _____

(e) What would be a reasonable Domain within the context of the situation? _____

(f) What would be a reasonable Range within the context of the situation? _____